FUSION INDUSTRY ASSOCIATION

The Voice of a new Industry

The Fusion Industry Association is an international coalition of companies working to electrify the world with fusion - the unparalleled power of the stars. Energy from fusion will provide clean power for everyone that's safe, affordable, and limitless.

What is the Fusion Industry Association?

FUSION INDUSTRY ASSOCIATION

The FIA is the voice of the growing private fusion industry.

The Association promotes the interests of its members by strategically advocating with policymakers, regulators, and stakeholders on ways to accelerate commercial fusion power.

Membership

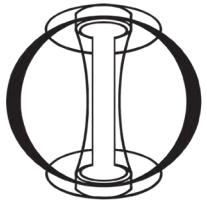
FUSION INDUSTRY ASSOCIATION


Commonwealth Fusion Systems

generalfusion®


TAE TECHNOLOGIES


first light


tokamak energy
a faster way to fusion


ZAP ENERGY


HELION


HB11 ENERGY
LASER BORON FUSION


AVALANCHE

TYPE ONE ENERGY


LPP FUSION


FOCUSED ENERGY

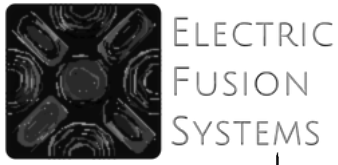

MIFTi


SHINE


MarvelFusion

Xcimer Energy Company


CTFusion
As Brilliant as the Sun


ELECTRIC FUSION SYSTEMS


RENAISSANCE FUSION


HYPERJET FUSION CORP


Helical Fusion


HelicitySpace


HORNE TECHNOLOGIES


NTK


PrincetonSATELLITE SYSTEMS

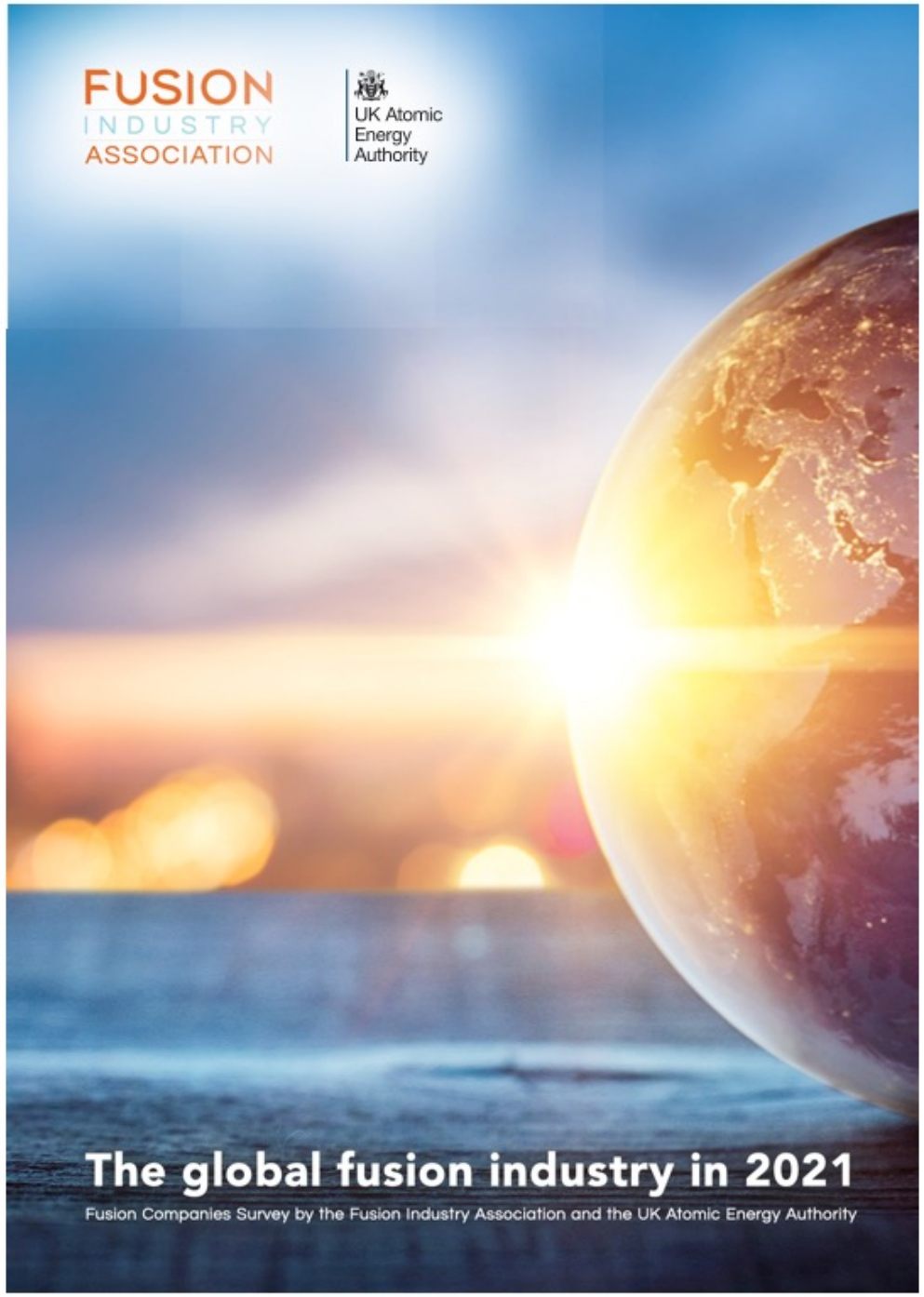

nearstar FUSION


EX-Fusion

The global fusion industry in 2021

Survey from Q2 2021:

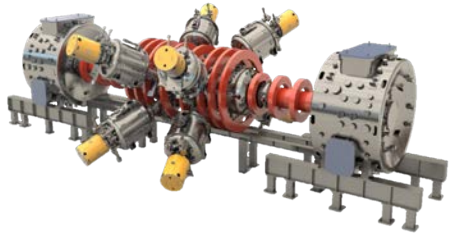
- 31 verified private fusion companies
  - 27 Members of the FIA, 21 American
- Survey: $1.87 billion invested – and has grown to over $4.4 billion by January 2022
- Companies are focused on electricity generation (96%) by the 2030s or before (83%)

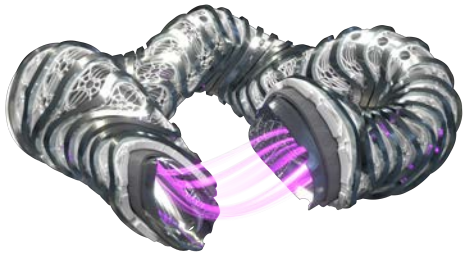


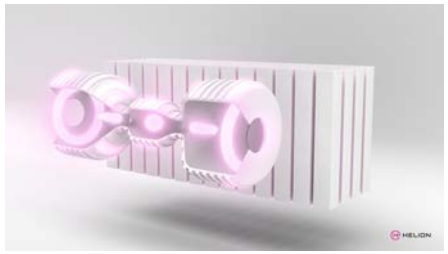
Private Fusion Accelerating to a Timeline that is Relevant

FUSION INDUSTRY ASSOCIATION

60 years of research	Mid 2020s	Late 2020s	Early 2030s	Mid 2030s
• Scientific basis for fusion energy	• Scientific Proof of Concept	• Design and build Pilot Plants	• Operate Pilot Plants, first sales	• Commercial Fusion, rapid scale-up to global deployment







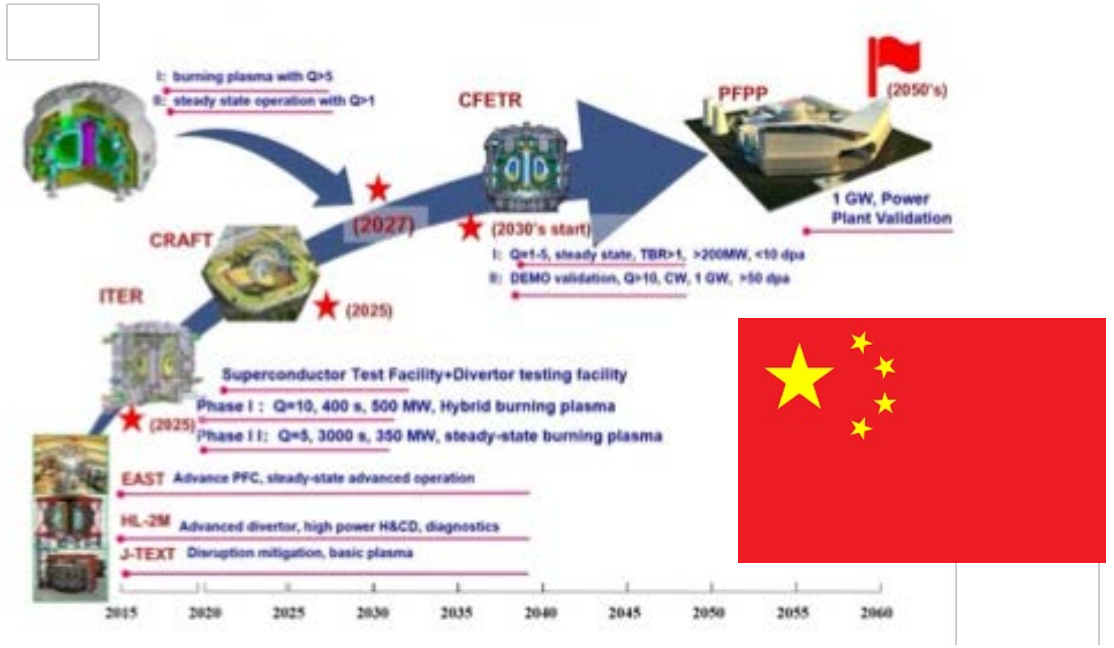
A Global Competition

FUSION INDUSTRY ASSOCIATION

Department for Business, Energy & Industrial Strategy

Towards Fusion Energy

The UK Government's Fusion Strategy



Our “Bold Decadal Vision”

FUSION INDUSTRY ASSOCIATION

The creation of a U.S. based, world leading fusion energy industry

- Global manufacturing export industries centered in new fusion technology hubs around the country.
- Training and supporting the high-tech workforce and economic wealth that will derive from a $1 trillion market.
- Multiple fusion pilot plants of different sizes, technologies, and fuel cycles
- Making sure the fusion energy revolution will come fast enough to meet the challenge of global warming.
- Achieving true energy security: Putin and his like can never again use resource dominance to finance a war machine and extort neighbors

Recent history in energy technology development is… not strong

FUSION INDUSTRY ASSOCIATION

- Effective deployment of U.S. developed technologies… manufactured overseas

Lessons from Creating the Nuclear Industry

FUSION INDUSTRY ASSOCIATION

U.S. Cooperative Power Reactor Demonstration Program (1955-1962)

- Atomic Energy Commission pursues a wide variety of public-private partnership models, in cooperation with utilities around the country
- Result: the creation in 1960s-70s of a global export industry, supporting high-tech manufacturing hubs and a world-leading industry

Source: EPRI Report No. 3002010478
Roles in the Research, Development, Demonstration, and Deployment of Commercial Nuclear Reactors: Historical Review and Analysis

U.S. Cooperative Power Reactor Demonstration Program (CPRDP)

FUSION INDUSTRY ASSOCIATION

1954

- Shippingport (PWR)

1955 Round 1

- Yankee Rowe (PWR)
- Hallam (Sodium Graphite)
- Enrico Fermi (Sodium Fast Breeder)

1955 Round 2

- Elk River (BWR)
- Piqua (Organic-Cooled and Moderated)
- BONUS (Boiling Water + Integral Superheat)
- La Crosse (BWR)

1957 Round 3

- Big Rock Point (BWR)
- Carolina-Virgnia Tube Reactor (PHWR)
- Pathfinder (BWR+ Nuclear Superheat)
- Peach Bottom (HTGR)

1962 Round 3 (modified)

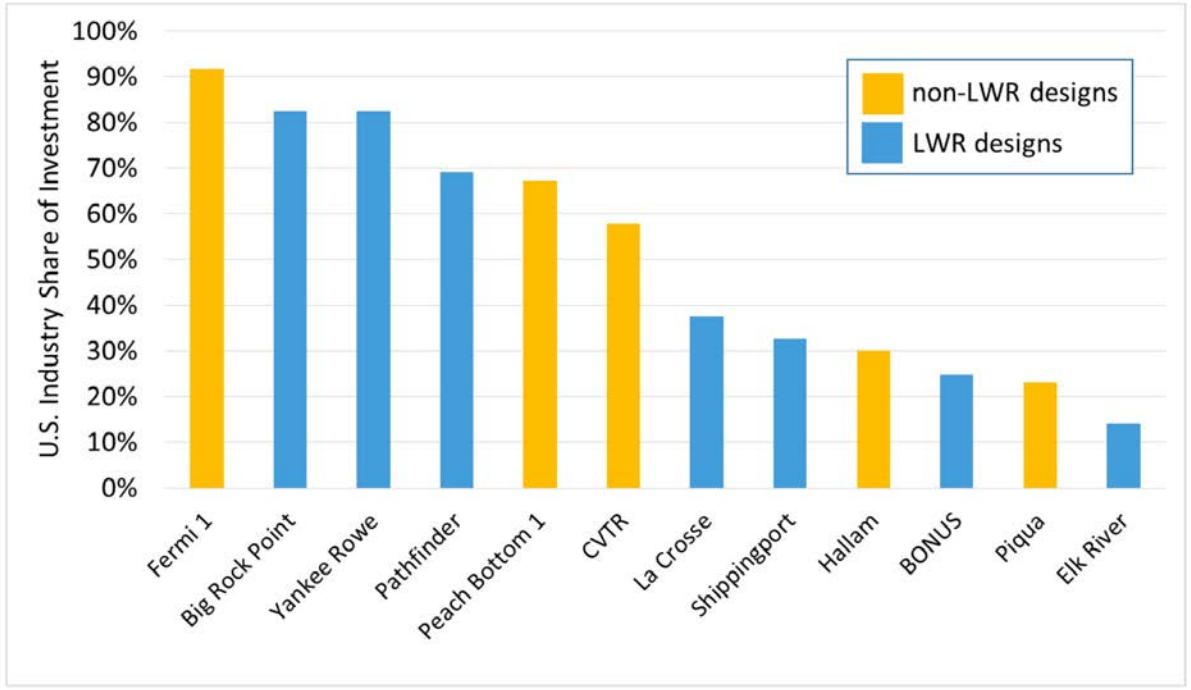
- Haddam Neck (PWR)
- San Onofre (PWR)

- 12 demonstration reactors of 9 different technologies, resulting in the 1962 decision to focus on large-scale PWRs to demonstrate commercially-viable design, construction, and operation.

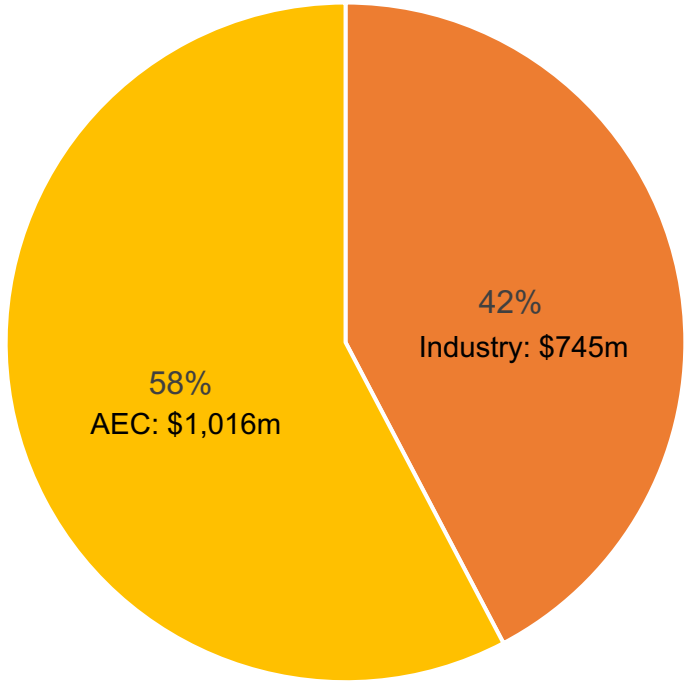
Flexibility in Cost Share

FUSION INDUSTRY ASSOCIATION

Public and Private Investment for CPRDP-Era Reactors



Cumulative Public and Private Sector Investment in U.S. Nuclear Power Through 1962



Total US Investment, 1954-1962: $1.76 billion
(Over $12 billion in 2022 dollars)

Principles for an Effective Public Private Partnership

FUSION INDUSTRY ASSOCIATION

- A milestone cost-share program will require upfront investment on the part of the private party, so the balance of the benefits should be weighted toward the private party, especially on ownership of IP.
- Funding terms should not be complicated and supported by mutually agreed project milestones.
- The cost-share program will create a U.S. based, globally leading fusion energy industry. Its importance should allow for some creativity and flexibility in both program design and contract execution.

FUSION INDUSTRY ASSOCIATION

Preconditions for Success

Public Private Partnerships cannot succeed in a vacuum

Fusion Science Program Embraces Commercialization

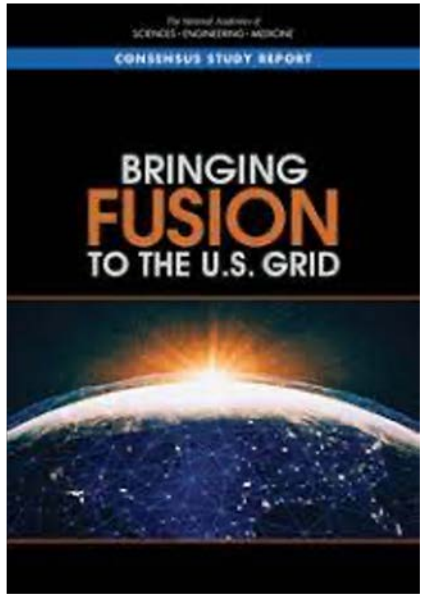
FUSION INDUSTRY ASSOCIATION

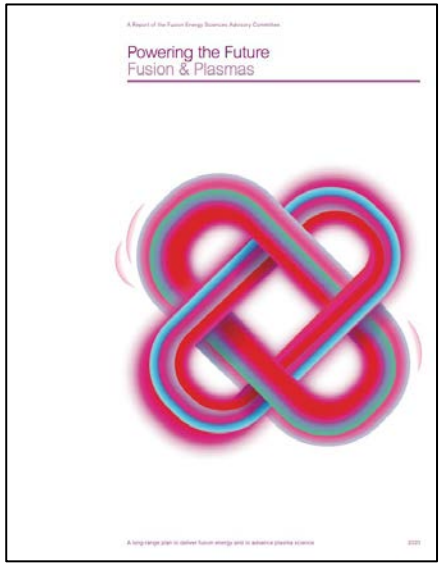
U.S. Fusion program must embrace a mission to accelerate fusion energy

DOE can support fusion commercialization push with world-leading science, computing power, and user facilities.

DOE will build the **infrastructure** *(but not the pilot plants)* that enables an American fusion industry.

DOE-funded scientists will form the backbone of the fusion workforce, and train the next generation.





Regulators Provide Certainty

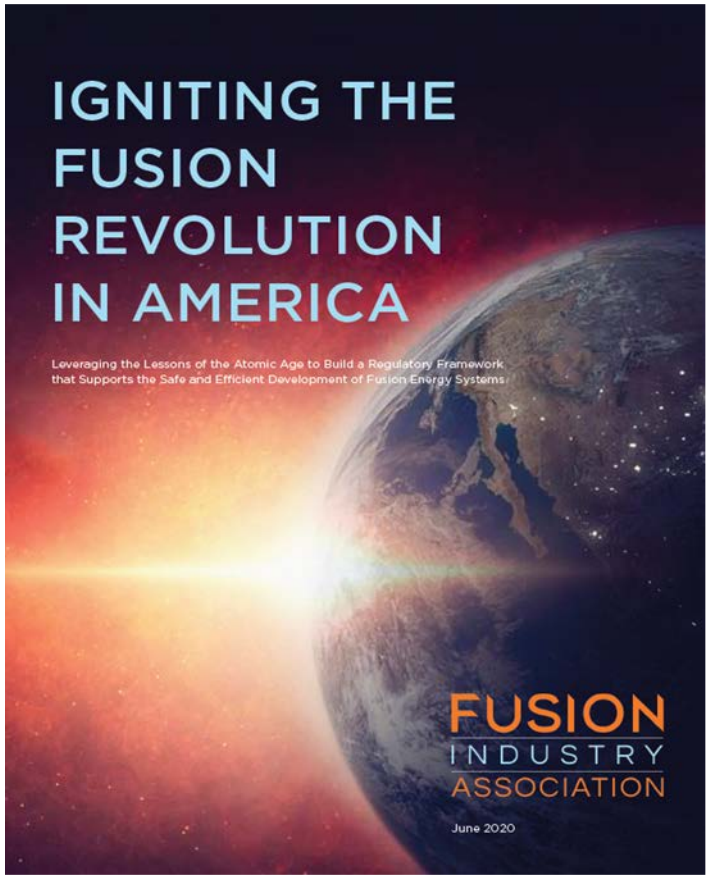
FUSION INDUSTRY ASSOCIATION

Principle: Fusion is Different than Fission

US Nuclear Regulatory Commission

- A “Byproduct Materials” approach to regulation best ensure public safety and accelerated adoption of fusion energy
- NRC should support staff with investment in more fusion expertise
- <u>Status:</u>
  - Expect an “Options Memo” to the Commission in 2022
  - Ongoing public process to determine options for regulatory framework for fusion energy

IAEA can inform a global fusion regulatory structures



FUSION INDUSTRY ASSOCIATION

"The country demands bold, persistent experimentation It is common sense to take a method and try it: If it fails, admit it frankly and try another. But above all, try something."

-Franklin Delano Roosevelt, May 22, 1932

Thank you

www.fusionindustryassociation.org

Aholland@fusionindustryassociation.org